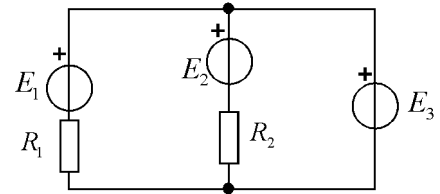


1. U kolu prikazanom na slici odrediti:

- jačinu struja u svim granama kola,
- snage svih generatora ems,
- ukupnu snagu Džulovih gubitaka u kolu,

Brojni podaci su: $E_1 = 10\text{ V}$, $E_2 = 20\text{ V}$, $E_3 = 30\text{ V}$, $R_1 = R_2 = 100\Omega$.



RESENJE

a) I KZ:

$$A: \quad I_1 + I_2 + I_3 = 0, \quad I_3 = 0,3\text{ A}$$

II KZ:

$$k1: \quad -E_3 + E_1 - R_1 I_1 = 0, \quad I_1 = -0,2\text{ A}$$

$$k2: \quad -E_3 + E_2 - R_2 I_2 = 0, \quad I_2 = -0,1\text{ A}$$

b)

$$P_{E1} = I_1 E_1 = -2\text{ W},$$

$$P_{E2} = I_2 E_2 = -2\text{ W},$$

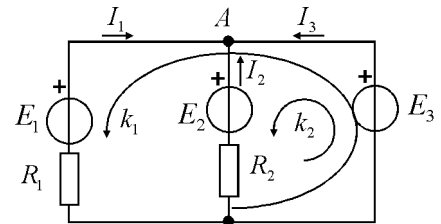
$$P_{E3} = I_3 E_3 = 9\text{ W}$$

c)

$$P_{R1} = R_1 I_1^2 = 4\text{ W},$$

$$P_{R2} = R_2 I_2^2 = 1\text{ W},$$

$$P_J = P_{R1} + P_{R2} = 5\text{ W}.$$

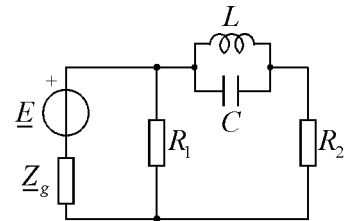


2. U kolu prikazanom na slici odrediti:

- trenutnu vrednost elektromotorne sile E ,
- ekvivalentnu impedansu kojom može da se zamene kalem i kondenzator,
- kompleksnu vrednost struje kroz otpornik R_1 ,
- kompleksnu snagu generatora.

Poznato je: $\underline{E} = j40\text{ V}$, $\underline{Z}_g = j20\Omega$, $R_1 = R_2 = 20\Omega$,

$L = 10\text{ mH}$, $C = 100\mu\text{F}$, $\omega = 1000\text{ rad/s}$.



RESENJE

a) trenutna vrednost elektromotorne sile E

$$e(t) = 40\sqrt{2} \cos(1000t + \pi/2)\text{ V}$$

b) ekvivalentna impedansa

$$\underline{Z}_L = j10\Omega, \quad \underline{Z}_C = -j10\Omega, \quad \underline{Z}_{ekv} = \frac{\underline{Z}_L \underline{Z}_C}{\underline{Z}_L + \underline{Z}_C} = \infty$$

c) kompleksna vrednost struje

$$\underline{I} = \frac{\underline{E}}{\underline{Z}_g + R_1} = \frac{0 + j40}{20 + j20} = (1 + j1)\text{ A} = \sqrt{2}e^{j\pi/4}\text{ A}$$

d) Kompleksna snaga generatora jednaka je

$$\underline{S}_E = \underline{E} \underline{I}^* = (40 + j40)\text{ VA}.$$

